



US 20210373610A1

(19) **United States**(12) **Patent Application Publication** (10) **Pub. No.: US 2021/0373610 A1**
(43) **Pub. Date: Dec. 2, 2021**(54) **SELF-ACTUATING HINGE MECHANISM
FOR ELECTRONIC DEVICE**(52) **U.S. CL.**
CPC **G06F 1/1681** (2013.01); **G06F 2200/1637**
(2013.01); **F16M 11/10** (2013.01); **G06F**
3/013 (2013.01)(71) Applicant: **Apple Inc.**, Cupertino, CA (US)(72) Inventors: **Qiliang Xu**, Livermore, CA (US);
Kevin M. Robinson, Sunnyvale, CA
(US); **Xiaonan Wen**, San Jose, CA
(US); **Shingo Yoneoka**, Sunnyvale, CA
(US)(57) **ABSTRACT**

A notebook computer may include a display portion, a base portion, a hinge mechanism movably coupling the display portion to the base portion, an optical sensing system configured to capture an image of an object, an actuation system comprising a shape-memory alloy member coupled to the base portion and the display portion and configured to move the display portion relative to the base portion, and a processing system. The processing system may be configured to determine a target position for the display portion based at least in part on a location of the object in the image and cause the actuation system to actuate the hinge mechanism to move the display portion, relative to the base portion, from an initial position to the target position.

(21) Appl. No.: **16/885,045**(22) Filed: **May 27, 2020****Publication Classification**(51) **Int. Cl.**
G06F 1/16 (2006.01)
G06F 3/01 (2006.01)
F16M 11/10 (2006.01)